Assessment of Wisconsin's Stream Resources Using Probabilistic Sampling

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Until recently, stream monitoring conducted by the Wisconsin Department of Natural Resources (WDNR) has primarily been targeted sampling to provide information for stream-specific management issues. Physical, chemical, and biological data are often collected from either highly degraded streams affected by polluted run-off, or from high quality streams where game fish management or stream habitat enhancement efforts are being evaluated. This resulting data set can be strongly biased if used for making inferences about broad-scale conditions of the state's 42,000 miles of perennial streams. Spatial clustering of the WDNR's current sampling effort on a relatively small proportion of the state's streams and a focus on larger streams that support adult game fish also limit the ability to make meaningful statements about Wisconsin's entire stream population.

Beginning in 2003, the WDNR, with support from the U. S. EPA's Regional Environmental Monitoring and Assessment Program, conducted an assessment of the physical, chemical, and biological conditions of wadeable streams in the Driftless Area ecoregion, in western Wisconsin, using a probabilistic sampling design. In 2005, the National Wadeable Stream Assessment program provided a statewide assessment of the condition of stream resources. Comparisons of data collected at randomly-selected stream sites with reference condition data indicates that a significant proportion of the random stream sites (and by inference the state's entire wadeable stream population) exhibit a substantial degree of either physical, chemical, or biological degradation. The State of Wisconsin has subsequently incorporated probabilistic sampling designs into WDNRs water resources management programs to improve the characterization of the state's aquatic resources by using data of known statistical quality.

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